



A.D. 1836 N° 6988.

S P E C I F I C A T I O N

OF

JULIUS JEFFREYS.

RESPIRATORS.

L O N D O N :

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,

PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY :

PUBLISHED AT THE GREAT SEAL PATENT OFFICE,

25, SOUTHAMPTON BUILDINGS, HOLBORN.

Price 8d.

1857.



A.D. 1836 N^o 6988.

Respirators.

JEFFREYS' SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JULIUS JEFFREYS, of Osnaburgh Street, Regent's Park, in the County of Middlesex, Esquire, send greeting.

WHEREAS His present most Excellent Majesty King William the Fourth,
5 by His Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Twenty-third day of January, in the sixth year of His reign, did, for Himself, His heirs and successors, give and grant unto me, the said Julius Jeffreys, His especial licence, full power, sole privilege and authority, that I, the said Julius Jeffreys, my exors, admors, and assigns,
10 or such others as I, the said Julius Jeffreys, my exors, admors, or assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein expressed, should and lawfully might make, use, exercise, and vend, within England, Wales, and the Town of Berwick-upon-Tweed, my Invention for "IMPROVEMENTS IN CURING OR RELIEVING
15 DISORDERS OF THE LUNGS;" in which said Letters Patent is contained a proviso that I, the said Julius Jeffreys, shall cause a particular description of the nature of my said Invention, and in what manner the same is to be performed, to be inrolled in His said Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said in part
20 recited Letters Patent, as in and by the same, reference being thereunto had, will more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said Julius Jefferys, do hereby declare the nature of my said Invention, and

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the manner in which the same is to be performed, are fully described and ascertained in and by the following description thereof, reference being had to the Drawing hereunto annexed, and to the figures and letters marked thereon (that is to say) :—

My Invention consists in the employment of apparatus to abstract the heat 5 from the breath during the act of expiration (which it receives from the lungs and from the air passages), and give off or transfer such heat to the incoming air which is drawn in during the act of inspiration, and thus to warm the air, and render it unirritating to the bronchial and other pulmonary surfaces, by which means the person using such apparatus will constantly 10 breath warm air. To attain this object it is well known that invalids are sent to temperate parts of our island and to warm climates.

DESCRIPTION OF THE DRAWING.

In Figures 1 to 5, the letters in each corresponding with the parts they denote, Figure 1 is a front view of the case open, the side applied over the 15 mouth being the back. A, B, C, D, are a vertical line; H, G, I, a horizontal one; L, L, the lid open. Figure 5 is a side view of the case turned up; i. e., the upper or lower side of the case when applied to the face. Figure 4 is the back or side next the mouth. These three views are of the case mounted with its pads, springs, ribbon, &c. L, L, a simple oblong and arched 20 frame of wire in Figure 5, is fitted to the front edge of the case when closed, one end of which at L below is turned into a hinge to carry it; the other end closes over a hasp *h*. This wire carries a plate of silver finely perforated, so as to have about one thousand three hundred holes in the square inch, and about the two hundredth part of an inch thick, and large enough to cover the 25 front of the case. It is stitched to the wire and seen at P, P, Figure 1. It is colored to match a ribbon (not shown in the Drawing), but which proceeds from each end of the plate, of the same width above, but wider below to hide the chin, and passing towards the back of the head on each side of the face. Near the ears this ribbon meets a strap which is attached on each side 30 of the case to a splinter bar M, M, Figures 1, 3, and 5, fixed to the front of two wings projected from the ends of the case, and seen at H, G, Figures 1 and 3 and 5. The whole of the instrument is thus screened from view, while the breath and air have free egress and ingress through the large perforated plate, which has more than five thousand apertures. The interior of 35 the case is an oblong arch or a segment nearly of a hollow cylinder, but the front or convex and back or concave arch are not concentric, the side being one twelfth of an inch deeper at the middle N, N, Figure 5, than at

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the ends. The instrument is of different sizes. The case of the medium size is nearly two and a half inches long inside, between the ends G, G, $1\frac{3}{8}$ inches wide, and about $\frac{1}{3}$ of an inch deep (i. e., from front to back) in the middle, and a fraction less at the ends. Figure 2 and 3 represent the naked metal case without the mountings and attachments. Figure 2 is a section across the middle, and Figure 3 a perspective elevation of the whole. B, F, G, I, in all the Figures shows the mouth hole in the back of the instruments, the edges of which are turned into a little gutter $\frac{1}{2}$ of an inch deep and wide, seen at B, C, Figure 2, carried all round the hole. This carries the moisture which is gradually condensed from the breath, and conducts it to the lower side of the case D, along which lies a sponge, seen at S in the section (Figure 9) of the instrument, and occupying the space S, S, Figure 1, to the depth of $\frac{1}{10}$ of an inch towards the mouth hole, but covering the whole of that side within $\frac{1}{8}$ of an inch at each end, where the case is made narrower by smaller shoulders which support the packet of skeins, to be described presently. The sponge place or chamber has a strip of metal in front of it united to the lower side of the case, and seen at e in Figures 2 and 3. The sponge lying in this chamber absorbs all the humidity as it gravitates to the bottom of the case. On the exterior of the case there will be observed at each end two wings H, G, Figures 1, 2, 3, 4, and 5, about 1 inch long, as wide as the case and of the same curvature, and rounded at the extremities. They are, in fact, a prolongation of the plate in which is the mouth hole. As the metal is very thin (about one hundredth of an inch thick) they are stiffened and supported by a prolongation of the sides of the case, seen at G, G, in Figures 1, 3, and 5, which are gradually decreased, and are merely a narrow edge opposite H. The front of these wings give an attachment to the shanks of the splinter bars to which the supporting straps are fixed; but the chief use of these wings is at their back or facial surface, where they carry two soft pads or cushions o, o, o, Figure 4, of different materials, according to the taste of the wearers, as leather, velvet, silk, or fur. These pads rest against the cheeks at the sides of the mouth, which support whatever pressure the instrument is kept on with, and thereby relieve the lips from it, so as to allow them to move freely. These pads keep the case a little about one eighth of an inch off the mouth in the middle, so that air would pass in and out by the false passage thus left between the case and the lips were it not for the provision R, R, T, T, Figures 4 and 5, T, T, being a gentle spiral or gimp spring attached to the pads at each end, and enclosed and drawn in an arch by a little curtain of fine air-tight silk stretched to a leathern mounting which covers the whole exterior of the case. These slight springs apply themselves closely to the lips

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in all their movements, preventing any false passage, but with a pressure so gentle as to be in no degree unpleasant. This part of the case is magnified, or shewn on an enlarged scale, to shew the curtains, &c. distinctly. Figure 11 represents the exact dimensions of the medium size respirator. The instrument is detained in its position by straps attached to the splinter bars 5 M, M, Figures 1, 3, 4, and 5; and by this arrangement it is allowed to revolve about the hook in the middle of the bar, and thus to adapt itself with equal pressure to every face, whether the chin be a projecting or receding one. In front of the ears a narrow ribbon is hooked to the upper edge of the strap and meets that of the opposite side at the top of the head, or is attached 10 to the inside of the hat or bonnet of the wearer. The strap itself passes round to the back of the head, where it is hooked to the opposite one. The use of the ribbon just mentioned is to keep the strap and instrument from working downwards. The front broad ribbon stitched to the front perforated plate is merely ornamental, hiding from view the angles at the ends of the 15 case and the splinter bar attachments. This ribbon is united with the straps behind the ears, where it is terminated. Such is the case which holds the oral respirator. The operative parts of the instrument are shown in Figures 6 to 10, consisting of a packet of from four to eight skins of metallic thread, gold, silver, or platinum being the best material, though 20 I do not confine myself thereto, which is carefully laid over plates of silver or other metal about one one hundred and fortieth of an inch thick, and in the medium-sized instrument three inches long, and one and one fourth of an inch wide, with oblong perforations nearly half an inch long, and one tenth of an inch wide, over the whole surface; the intermediate upright bars 25 being one thirtieth, and the horizontal one fortieth of an inch wide. The perforations might be much larger, the horizontal bars might indeed be removed, but the action of the instrument, as well as its durability, would be thereby impaired, for these bars serve as a storehouse of the heat brought to them by the metallic threads. The metallic threads are laid on the plates nearest to 30 the mouth at one three hundredth of an inch apart, on the next at one six hundredth, and on the front or outermost plate of the packet at only one nine hundredth of an inch apart. Notwithstanding this extreme closeness nearly one half of the whole surface is to be unoccupied by metal, forming an abundant passage for the breath. Figure 6 represents one of the plates 35 partially covered with the metallic thread to shew the frame within. Figure 10 is an edge view of one of these skeins mounted above and below with a non-conducting edging of waterproof card; Figure 8 is an edge view of five of these in a packet kept the due distance apart by this card, and held together

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in the proper arch by an upper and lower plate of thin silver or other metal, which, however, should be such as not to be prejudicially acted on by the breath, seen at Figure 8, A, A, and Figure 7, A, A. These plates of silver above and below make all the skeins into one firm packet. The curvature of the packet corresponds with that of the front of the case, but it is more curved than the back or mouth side of the case, the form of which approaches to a hyperbolic curve. The difference in these two curvatures causes a space to be left between the packet and the case in front of the mouth hole, as seen at B, B, Figure 11, and B, Figure 9. This small space is one twelfth of an inch wide, and is sufficient for allowing the breath to expand itself to all parts of the back skein of the packet, after passing through the mouth hole. Figure 9 is a section across the middle of the instrument, when applied to the face. A, A, are the packet of skeins. B, the small back chamber or space. G, G, the gutter round the mouth hole. P, P, the front perforated screen plate. S, the sponge below for absorbing the condensed moisture. R, R, the springs enclosed in the air-tight silk, and lying against the lips. Figure 11 is a horizontal section of the whole instrument, and of the exact dimensions of that of the medium size. P, P, is the front screening plate; A, A, the packet of skeins; B, B, the space between them; G, G, the gutter all round the mouth hole; R, R, the partition of air-tight silk, which, in Figure 5, is shown greatly enlarged; T, T, one of the springs; *o, o, o, o*, the pads at each end fixed on H, H, the wings; *g, g*, the prolongation of the sides of the case, serving as buttresses to the wings; K, K, the broad front ribbon which meets V, V, the straps behind the wings; Y, Y, the small bands which are tied over the head. Thus no part of the oral respirator projects even half an inch from the face. The above is a description of the instrument which is adapted to the mouth alone, and which may be named the oral respirator. But it is requisite to provide an instrument which shall communicate with the nostrils as well as the mouth, to be worn by persons who have not accustomed themselves by the use of the former to breathe through the mouth alone. The oral and nasal (which might be compounded into a single word "orinasal") respirator differs from the other in the curvature of the packet of skeins being much greater, which occasions a narrowing of the space, as seen at *a, a*, Figure 12, when compared with *a, a*, Figure 11, while the height of the arch is much increased, making the chamber behind the packet five sixteenths of an inch deep above, that is immediately below the nose, and here is an opening in the upper side of the case founded by the dotted arc *m, m, m*, or *n, n, n*, Figure 12, and equal to the whole depth of the chamber, as seen at *q*, Figure 12. The edge of metal round this hole, excepting that next the upper lip, is turned over into

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a groove to receive the bent lower wire of the shield Z, Z, Figure 12, and shown detached at *b, b*, Figures 13, 14, and 15, V being the naked wire, and W and X the wire covered with air-tight silk. The silk is on the outside of the wire, so that the wire at V, V, Figures 13 and 15, may slide into the groove round the hole in the upper side of the case. This shield is made of various 5 sizes to suit the noses of different persons, and has a narrow soft silk edging at top *t*, which serves to close any little pressure arising from irregularity of the feature, seen at Z, Z, Figures 13, 15, and 16. The air is thus enabled to pass freely from the nostrils behind the packets of skeins, and consequently issues in and out through them (all other access being closed), with the same 10 facility as that from the mouth, with the difference only that whilst most of the breath from the mouth has a horizontal course, that from the nostrils passes through the skeins obliquely downwards and outwards, as shewn by the diverging arrows *t, t, t, t*, Figure 16, at bottom. The back chamber is much narrower than above, as seen at Y, Figure 16, so as to admit of the elastic spring with 15 the silk partition being used, which, as before described, applies itself gently to the lower lip; above this provision is wanting, as there is not space for it on account of the free opening towards the nostrils. Here, therefore, the upper lip rests against the back of the case mounted with any soft substance. Now it is of importance to observe that while various substances may serve to con- 20 duct some of the heat from the breath, none will do it so effectually as a metallic one, and again, while many forms may be given to an instrument for this purpose, none other I believe will be found equal in its effect to that I have described, especially with reference to the division of the conducting substance into separate portions, as in the distinct skeins in the packet, and the 25 keeping of them apart by an imperfectly conducting substance, as the card which separates the several packets. By this separation of the skeins they are maintained at different temperatures, that of the outermost being the lowest, and are thereby enabled to take up much more of the heat of the breath than if they were all at one temperature, which would be their state were they 30 placed in contact with each other. This arrangement likewise qualifies them for supplying heat most advantageously to the incoming air, which, when cold, can take warmth even from the outermost skeins, and which, as it grows warmer in its progress inward, does still find every skein it arrives at warmer than itself, and therefore qualified to give heat to it. This particular arrange- 35 ment, whether a metallic conductor be employed or not, I claim as original. I also claim the employment of skeins, such as I have described, of fine threads or wires of any substance laid over a frame of any firm material whatever. Also the use of a case of any firm material for carrying the operative

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part of such instrument, and receiving the condensation from the breath, as well as the use of a sponge for absorbing this condensed moisture. So likewise do I claim the other part of the instruments, as the lip springs, the attachment bars, &c.

5 I would further observe that I consider the use of separate layers of any perforated substance, whether of metal or not, with or without the addition of fine thread or tissue, to fall within the scope of my Invention, for finely perforated plates of any firm substance, would, to a certain extent, execute the object of the Invention, which, as first stated, consists in applying apparatus
10 to collect the heat from the outgoing air, and give off such heat to the incoming air, and thus enable the wearer to breath warm air, such variations in the apparatus, though in a degree very inferior to that attained to by the use of metal extended into the finest thread, and placed on distinct laminæ of metal plates perforated as above described.

15 And lastly, I claim the right to the use of metal as a conducting substance for the above-described purpose, of what kind soever, and in what form soever the metal may be employed.

In witness whereof, I, the said Julius Jeffreys, have hereunto set
my hand and seal, this ——— day of ———, in the year
20 of our Lord One thousand eight hundred and thirty-six.

JULIUS (L.S.) JEFFREYS.

AND BE IT REMEMBERED, that on the Twenty-first day of July, in the year of our Lord 1836, the aforesaid Julius Jeffreys came before our said Lord the King in His Chancery, and acknowledged the Specification
25 aforesaid, and all and every thing therein contained and specified, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute made for that purpose.

Inrolled the Twenty-second day of January, in the year of our Lord One thousand eight hundred and thirty-six.

LONDON :

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1857.

Report of the

Commissioners of the

Board of Education

for the year ending

June 30, 1871

Albany, N. Y.

1871

Published by

the State of New York

under the authority of the

Legislature

in compliance with a

resolution of the

Legislature of 1869

and of 1870

and of 1871

and of 1872

and of 1873

and of 1874

A.D. 1836. JAN. 23. N^o 6988.
JEFFREYS' SPECIFICATION.

F I C I L

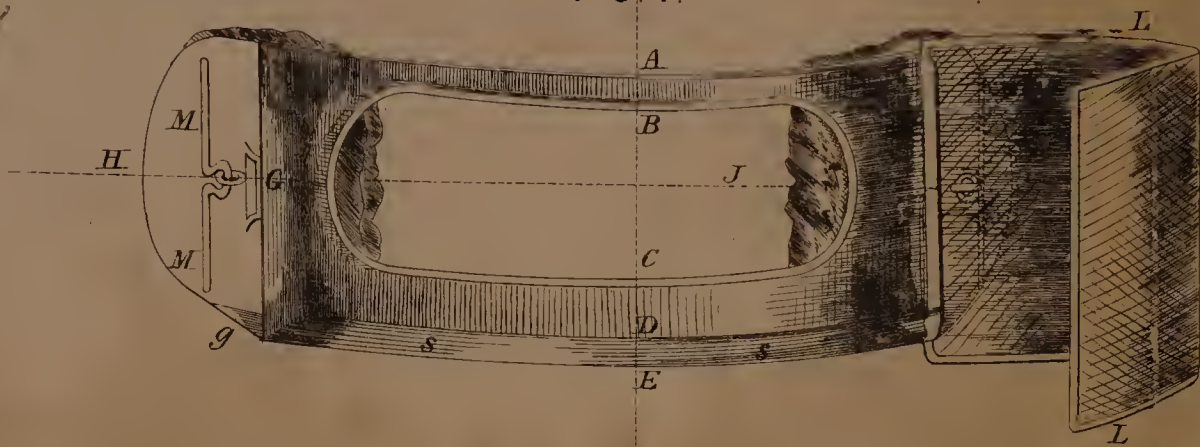
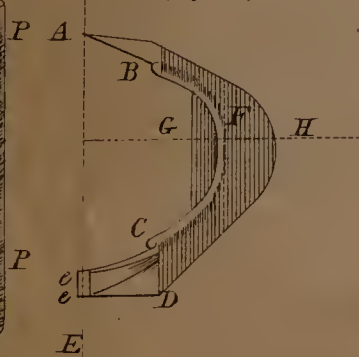
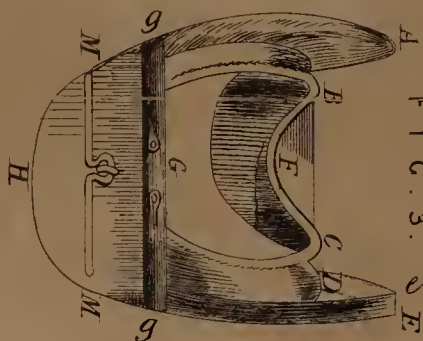


FIG. 2.



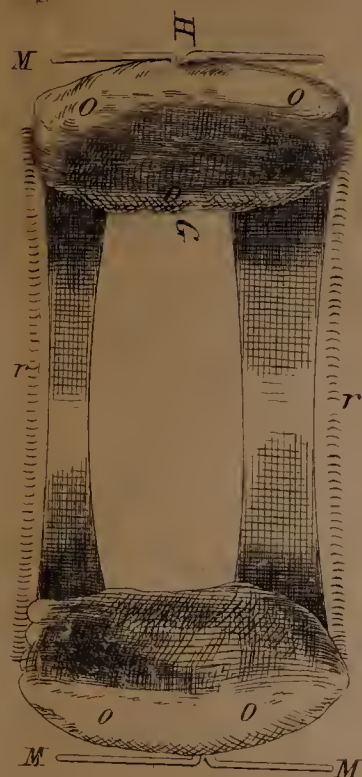
15



F I C . 5.



F1G.4

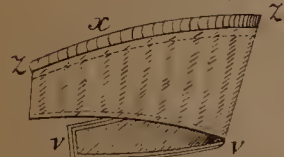


F I C. 14.



F I G . 12.

F I C . 13 .



F I C. 15.

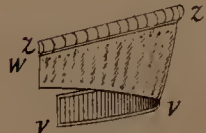
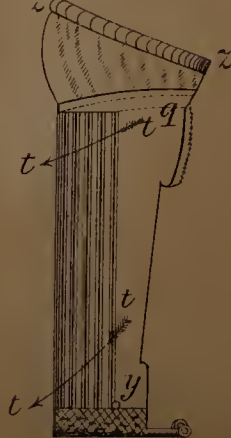


FIG. 16.



The enrolled drawing is partly colored.

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FIG. 6.

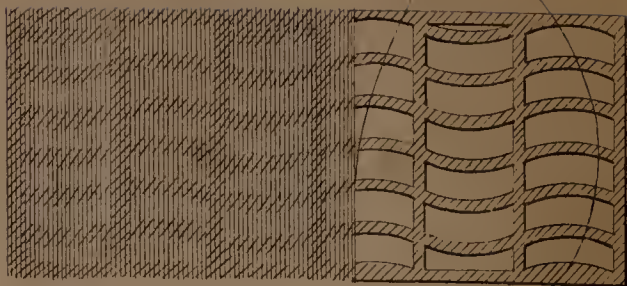


FIG. 8.A.

FIG. 8.

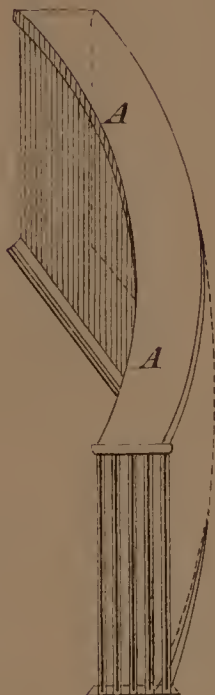


FIG. 8.A.



FIG. 10.

FIG. II.

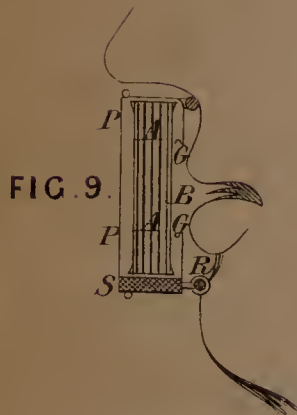
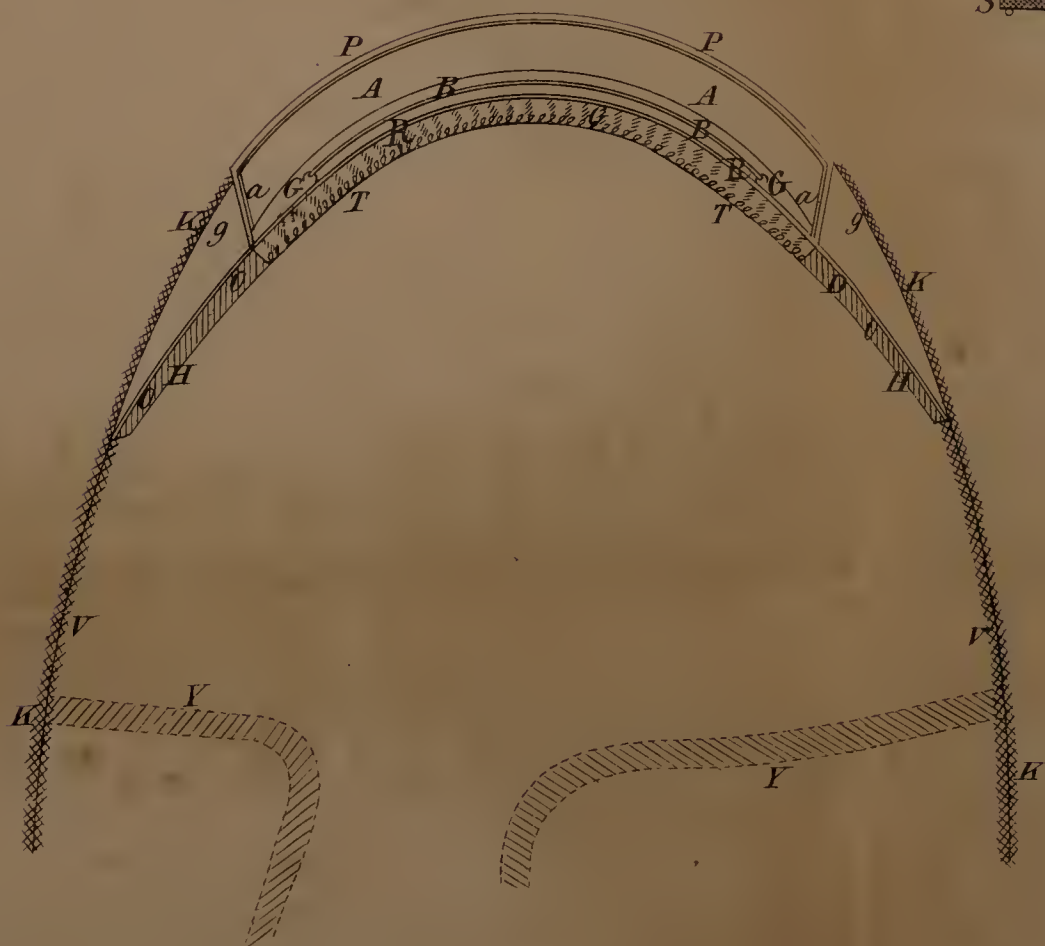


FIG. 9.

